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(19) **United States**(12) **Patent Application Publication**
Goeller et al.(10) **Pub. No.: US 2002/0178112 A1**(43) **Pub. Date: Nov. 28, 2002**(54) **POINT OF SALE CHECK SERVICE**(52) **U.S. Cl. 705/39**(75) **Inventors: Michael Goeller, Fremont, CA (US);
Candace Anthony Lilly, Half Moon
Bay, CA (US)**(57) **ABSTRACT**

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BERKELEY, CA 94704-0778 (US)**(73) **Assignee: Visa International Service Association**(21) **Appl. No.: 09/810,945**(22) **Filed: Mar. 15, 2001****Related U.S. Application Data**(60) **Provisional application No. 60/225,566, filed on Aug.
14, 2000. Provisional application No. 60/227,712,
filed on Aug. 24, 2000.****Publication Classification**(51) **Int. Cl.⁷ G06F 17/60**

A POS (point-of-sale) Check Service converts any paper check online and in real-time into an electronic funds transaction. The paper check is returned to the customer. A merchant enters the amount of the sale and electronically captures checking account data from the MICR line encoded on the check. The check data, identification data and sale amount are forwarded to a service organization for processing. The service has three options: Conversion Only; Verification with Conversion; and Guarantee with Conversion. Under Conversion Only the transaction is approved or declined with no account verification processing and the merchant retain the risk of loss. Under Verification with Conversion the check authorization message is routed to the participating drawee bank or to a third-party authorizing agent for verification that the check will be paid. Under Guarantee with Conversion, the check authorization request message is routed to the participating drawee bank or to a third party to guarantee the check. A check guarantor buys the check from the merchant at a discount.

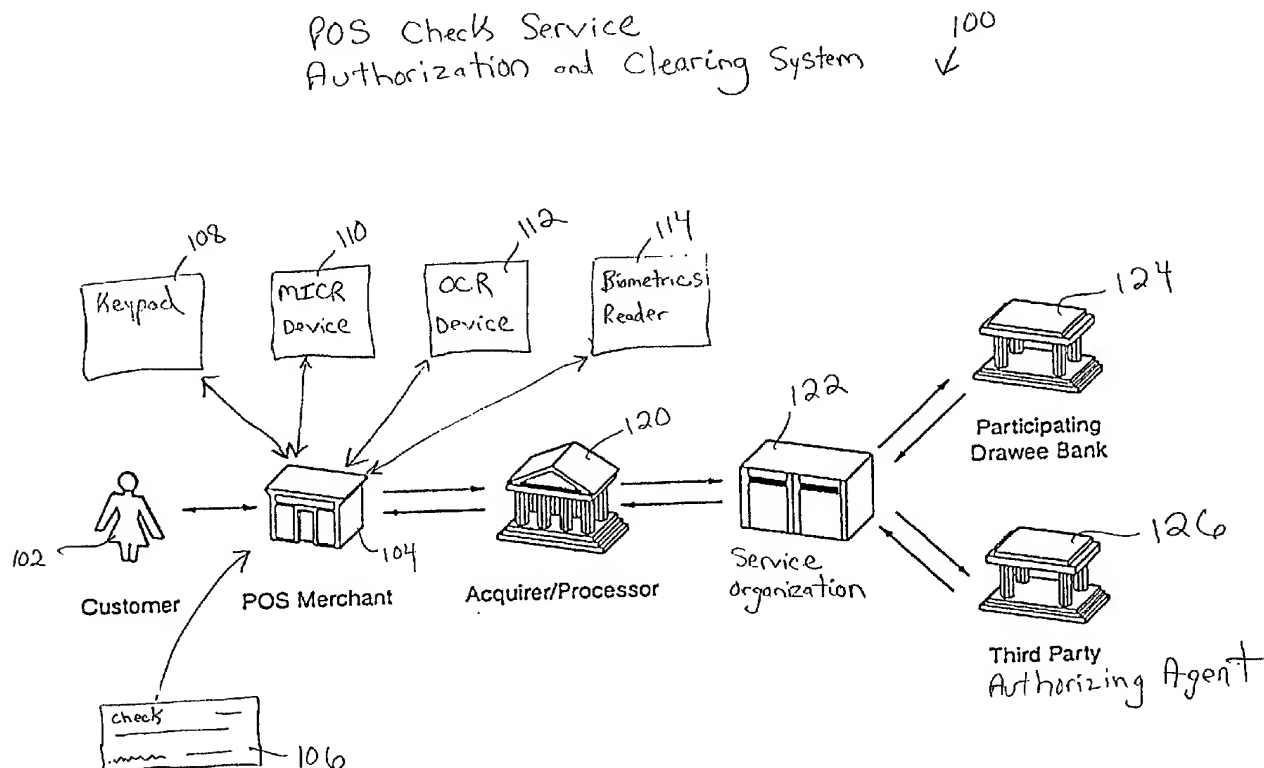
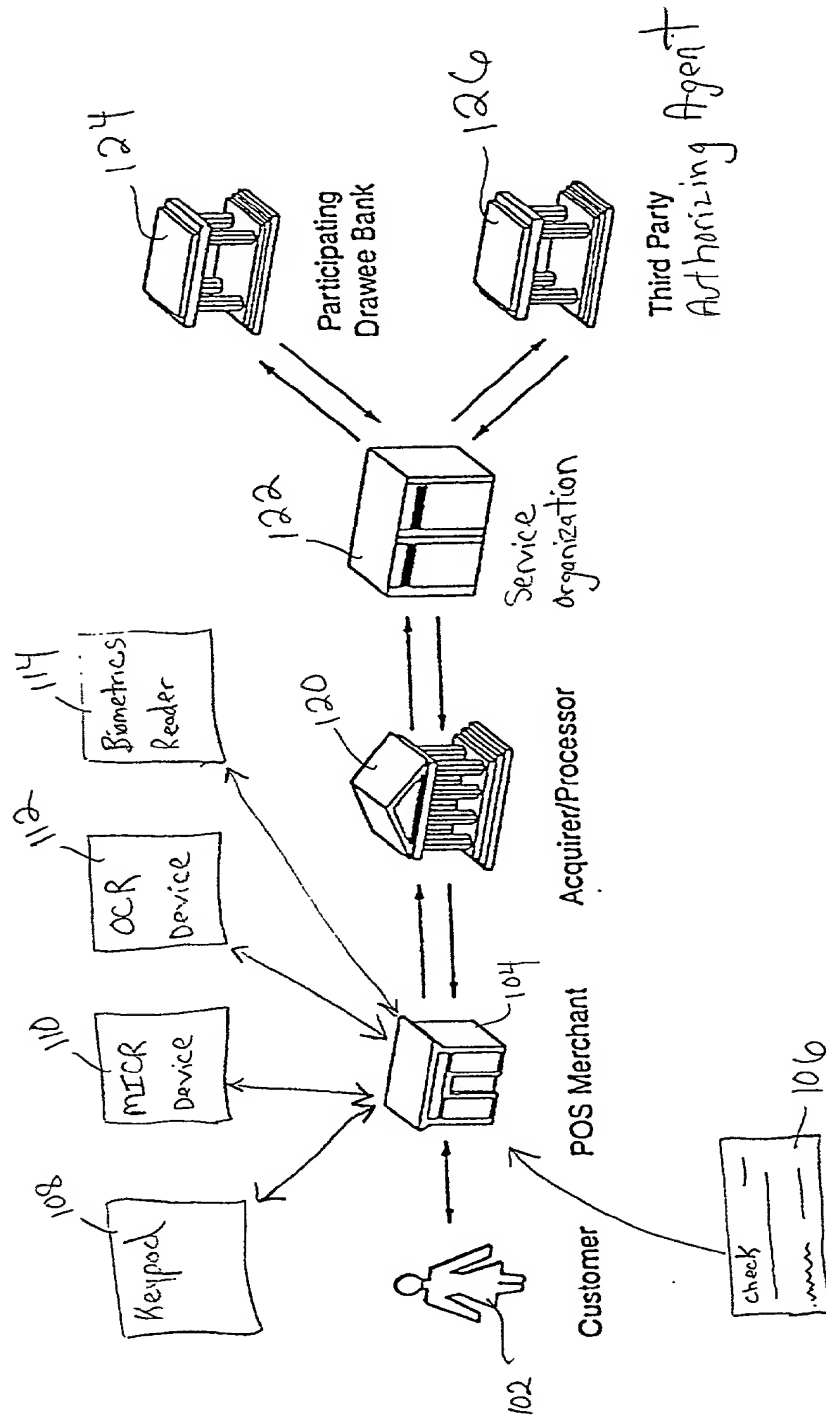


FIG. 1

POS Checks Service
Authorization and Clearing System

100



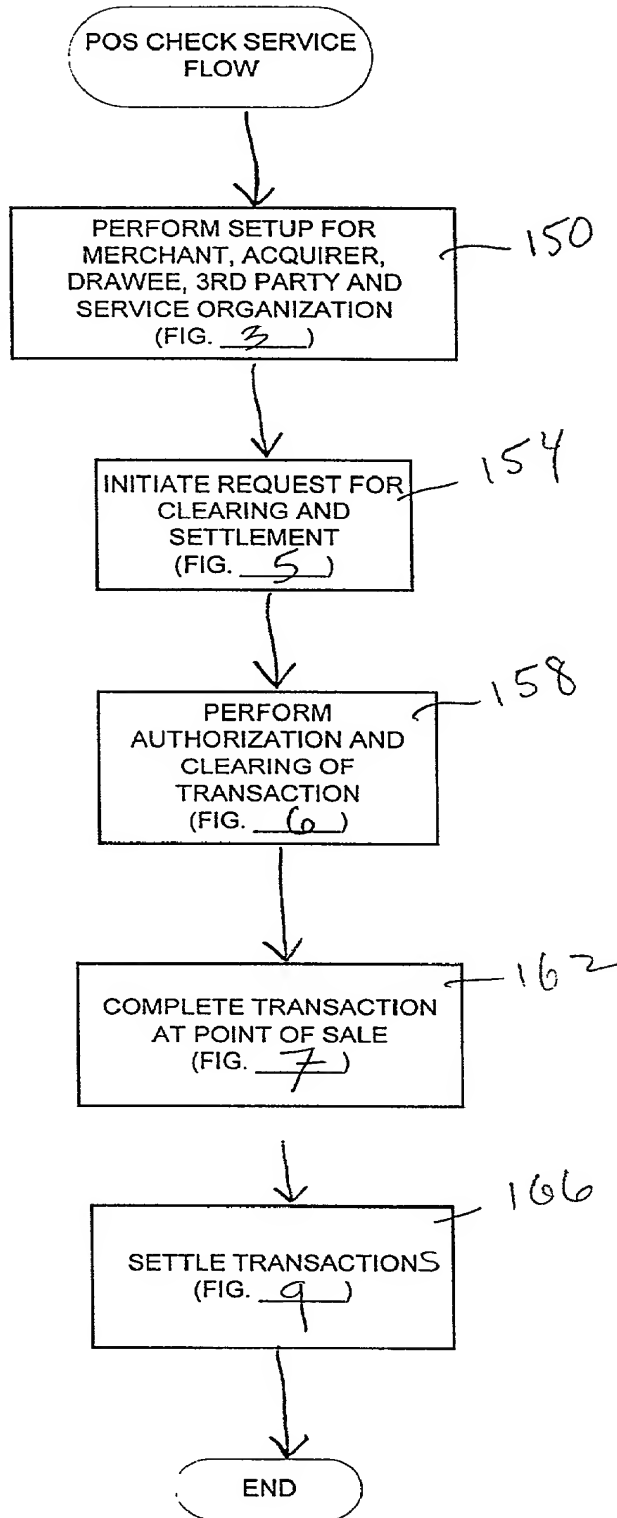


FIG. 2

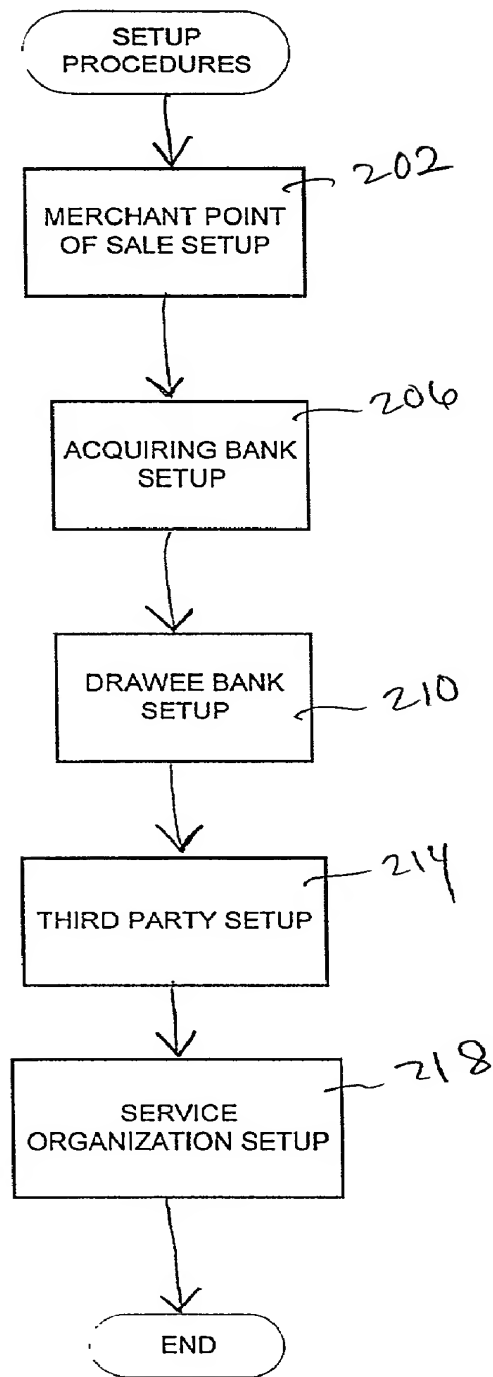
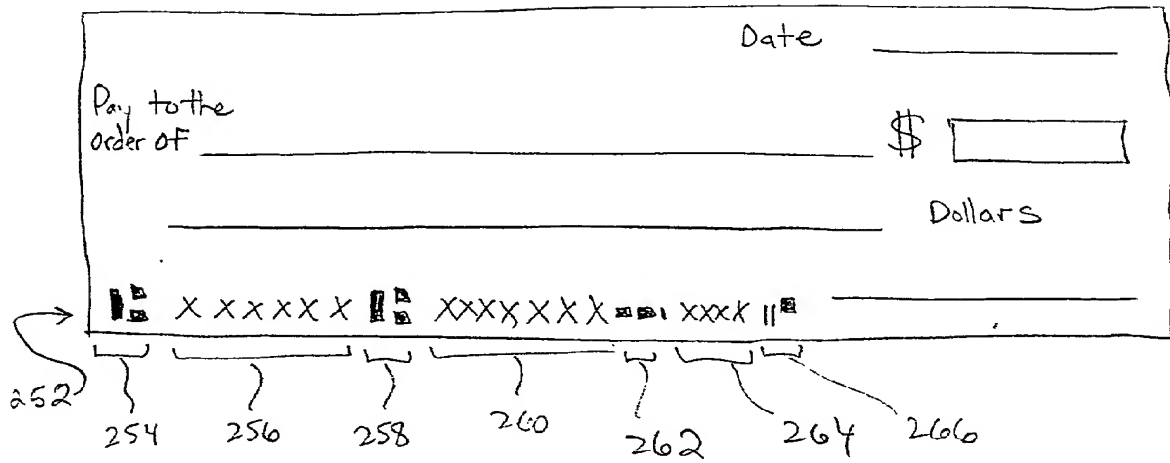


FIG. 3



↑
106

FIG. 4

FIG. 5

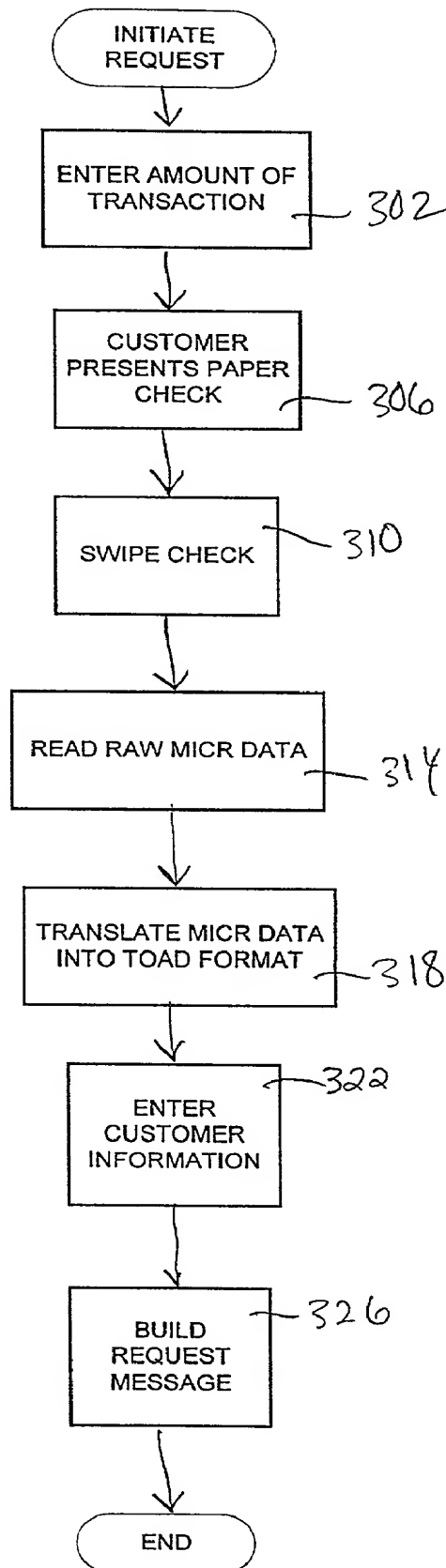
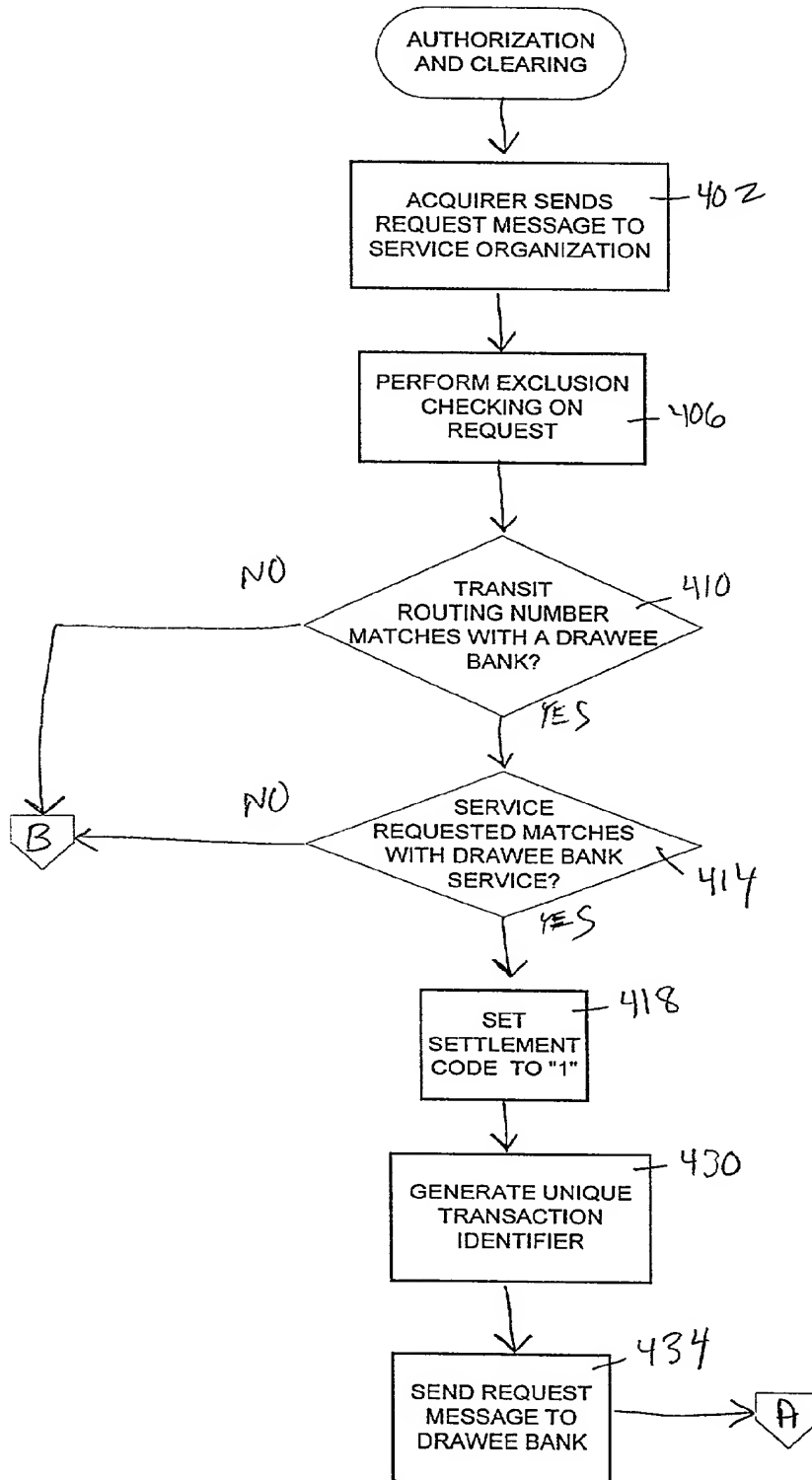
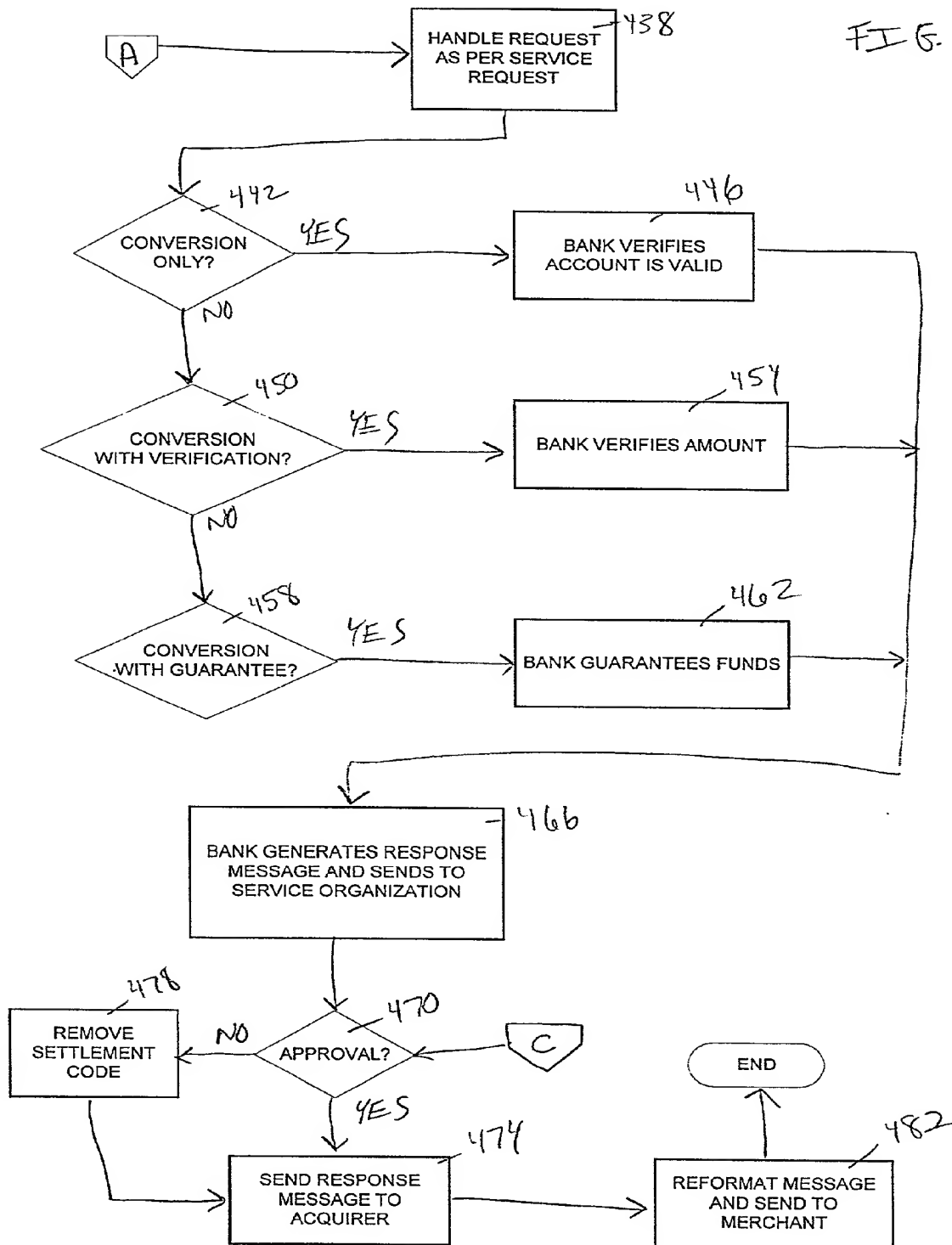


FIG. 6A





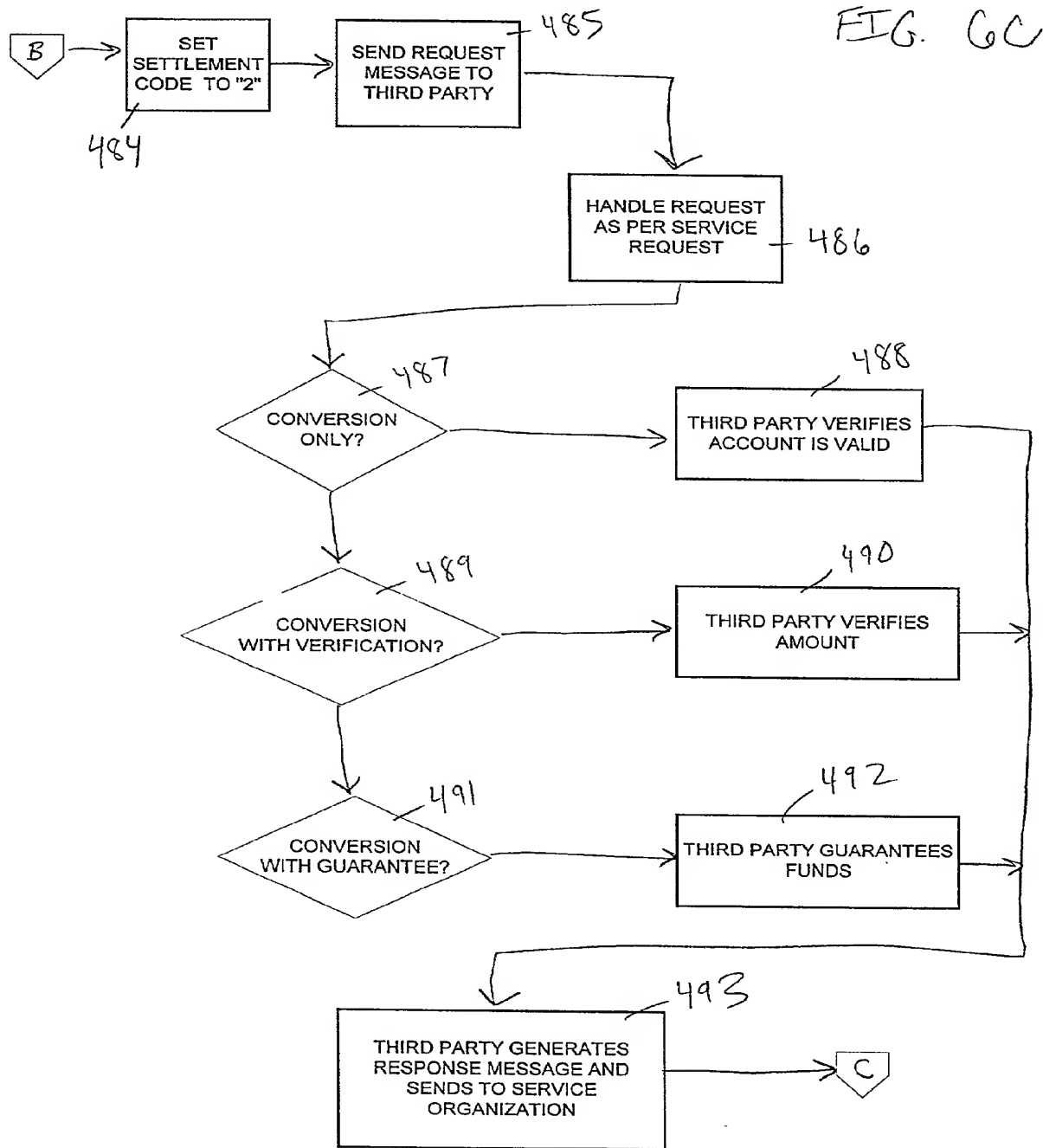
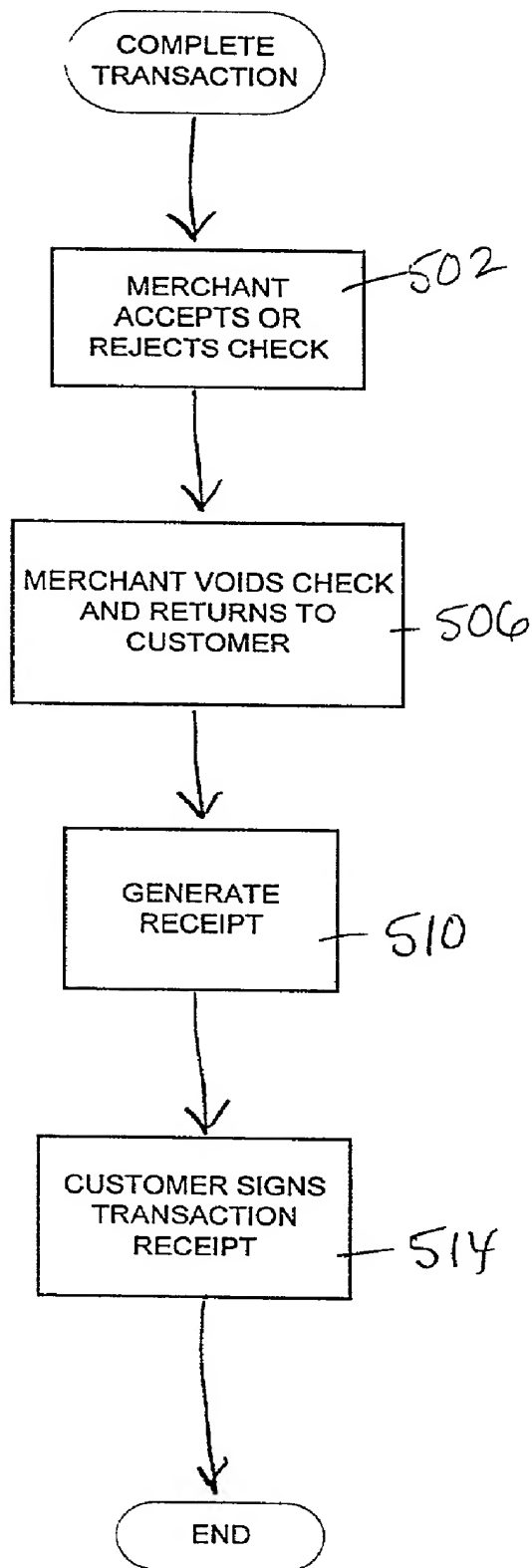


FIG. 7



Receipt Example

Merchant Name
Merchant Address
Merchant Phone
Date: 04/04/00
Time 11:56
Lane #99
Cashier #7777
AMOUNT OF TRANSACTION: \$82.35
AMOUNT OF SALE: \$62.35
CASHBACK: \$20.00
Routing # 122101191
Account # XXXXXX4587
Check # 1234
Customer's Bank: (optional)
Auth: 203500 Ref# 001002 (optional)
AUTHORIZATION AGREEMENT:
I authorize the merchant to use the information from my check to initiate an Electronic Fund Transfer (EFT) or a paper draft to debit my bank account for the amount of the transaction. I acknowledge and agree that the merchant-initiated EFT is not a check transaction, and is governed by applicable EFT law. In the event that the EFT or draft is returned unpaid, I understand and agree that the merchant may charge a return fee to my bank account.
X_____
Authorization Signature
Customer Service Number
Top Copy – Merchant
Bottom Copy -- Customer

FIG. 8

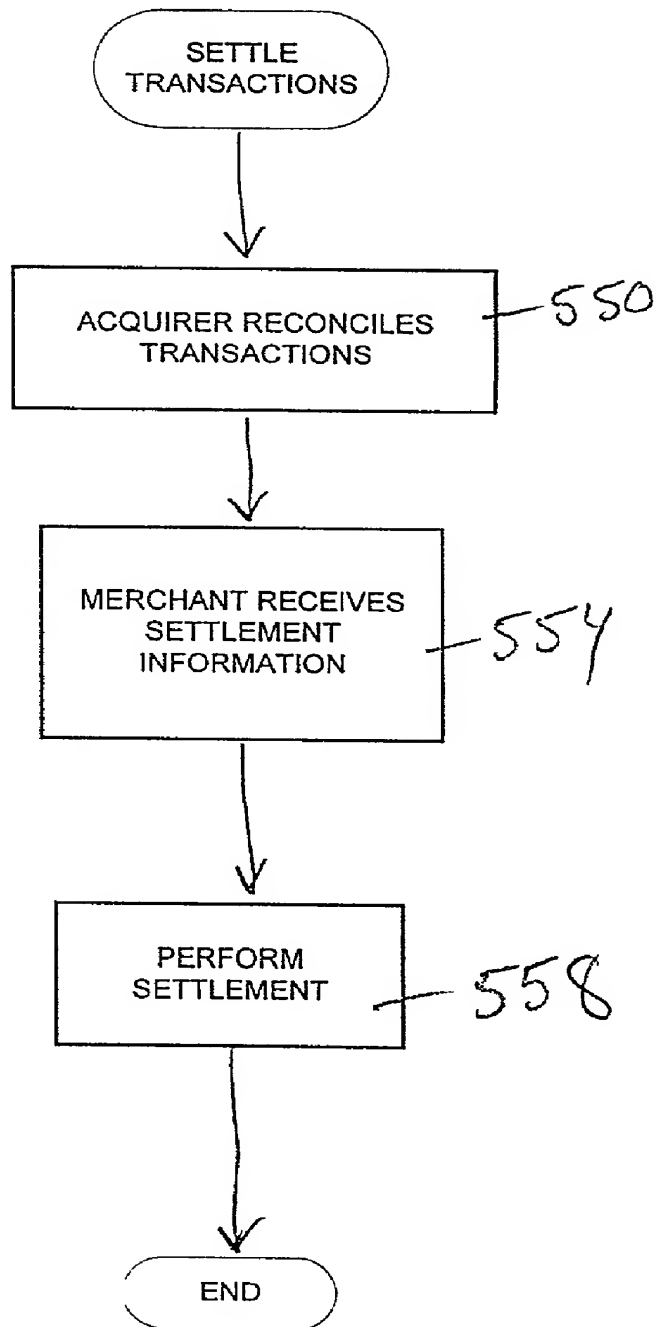
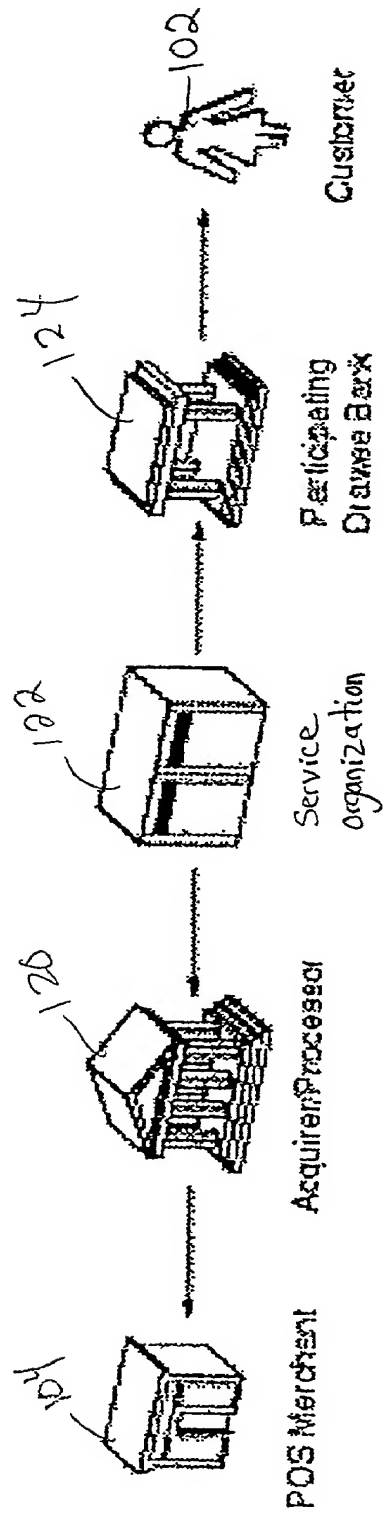
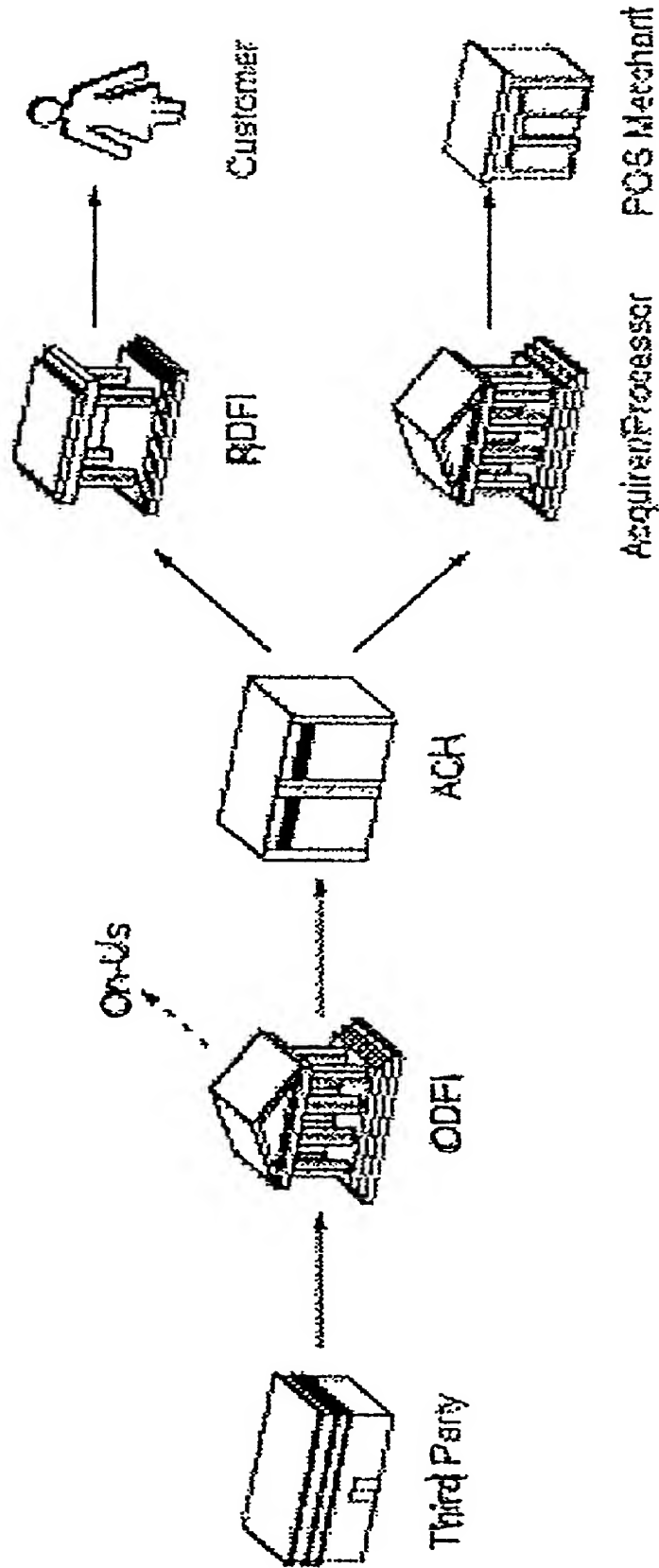


FIG. 9



Participating Bank Settlement

FIG. 10



Third Party Settlement

FIG. 11

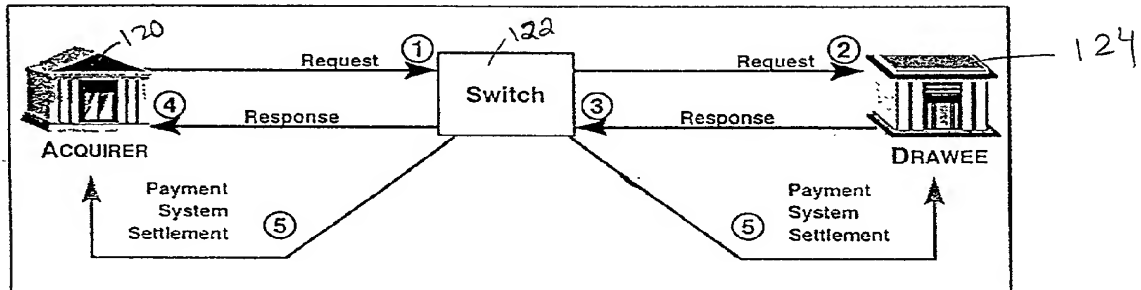
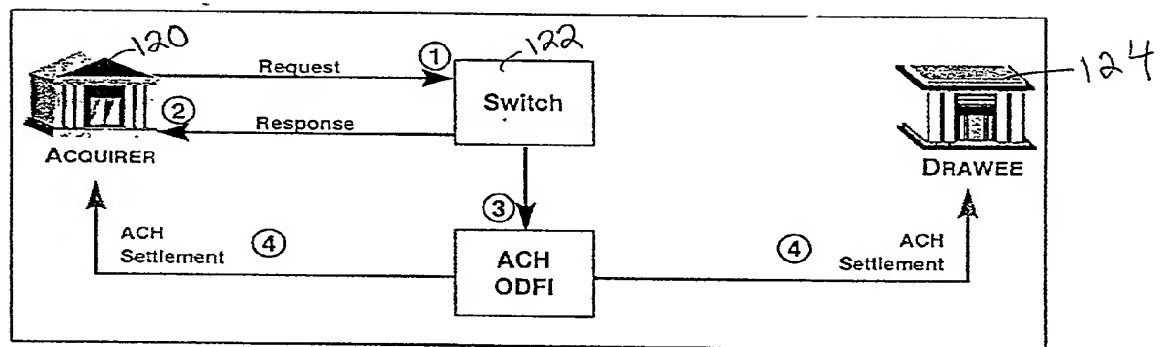


FIG. 12
Participating Drawee Bank Flow

FIG. 13

Non-participating Drawee Banks Flow



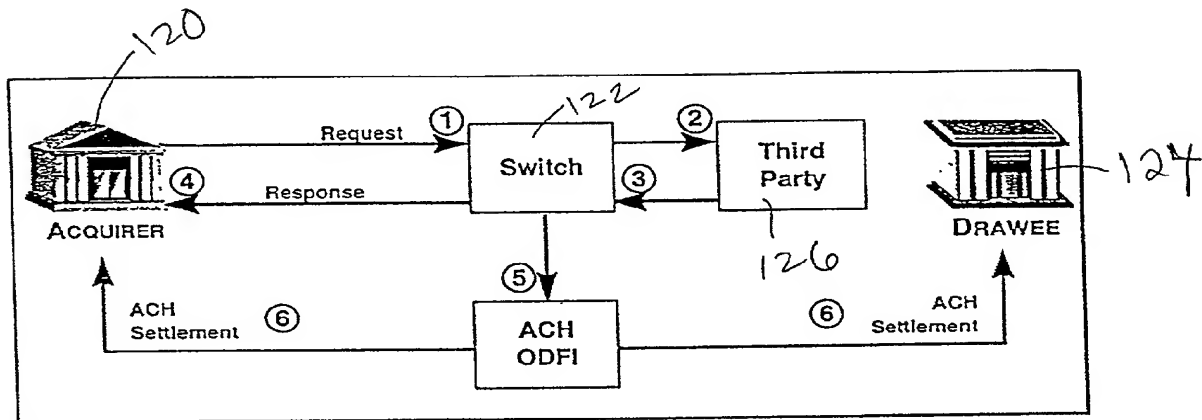


FIG. 14

Non-participating Drawee Bank Flow

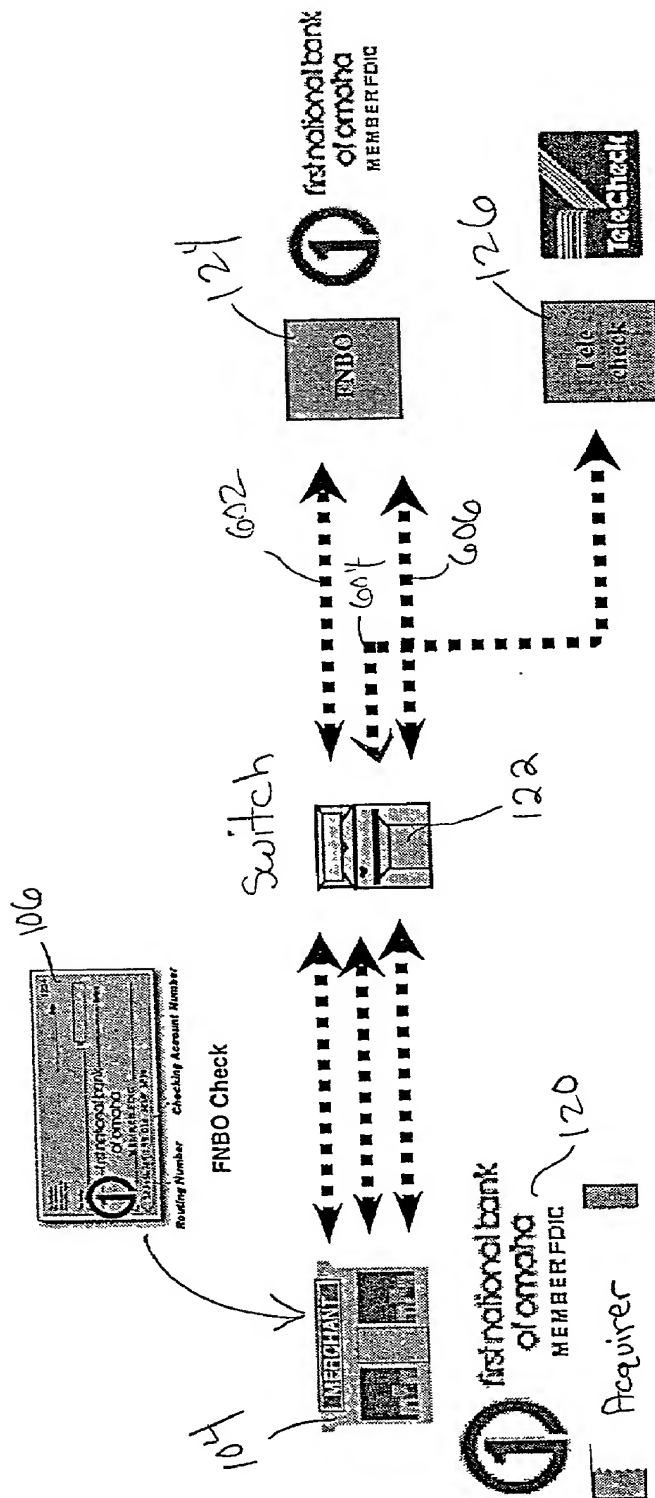


FIG. 15

Authorization Flow

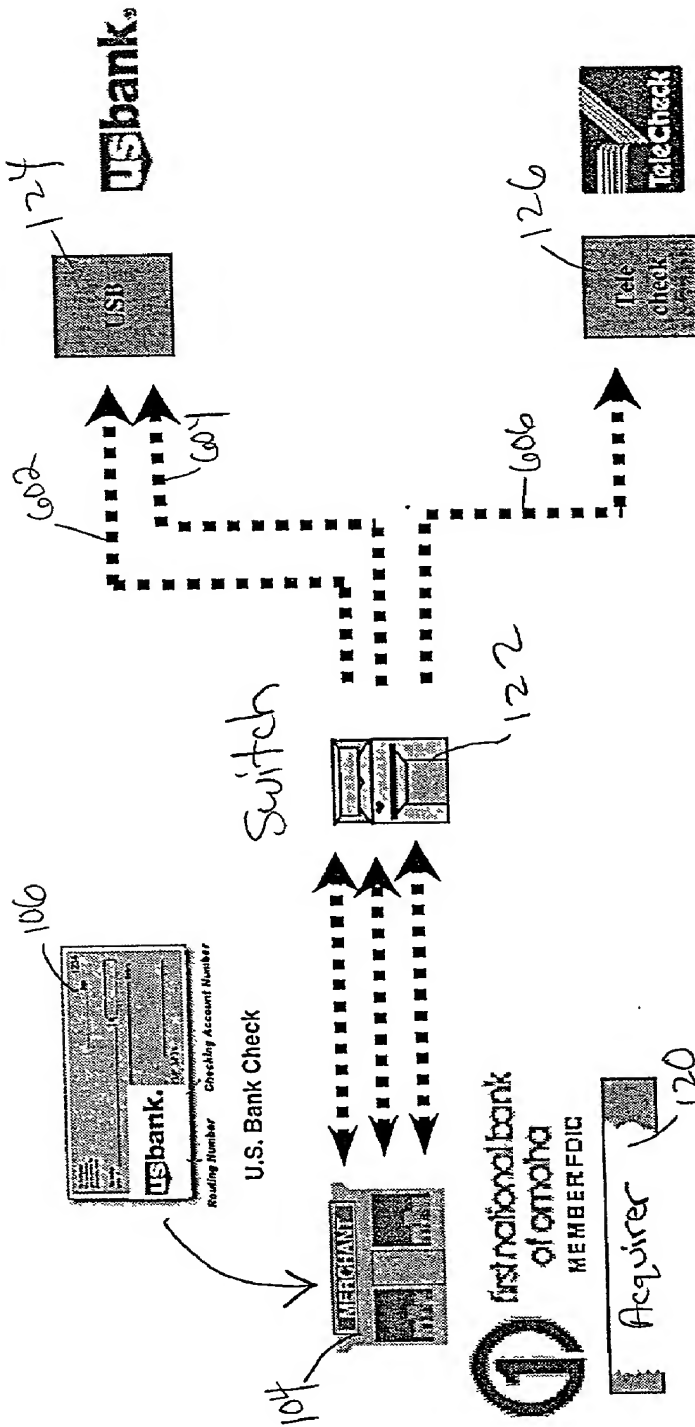


FIG. 16
Authorization Flow

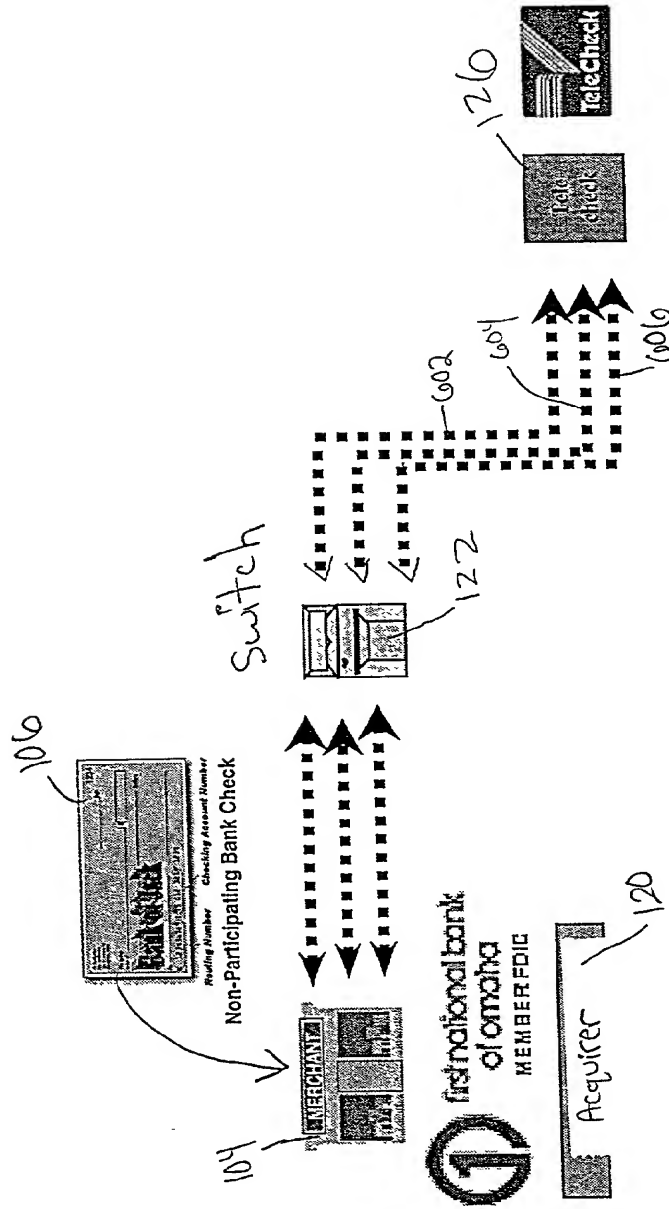
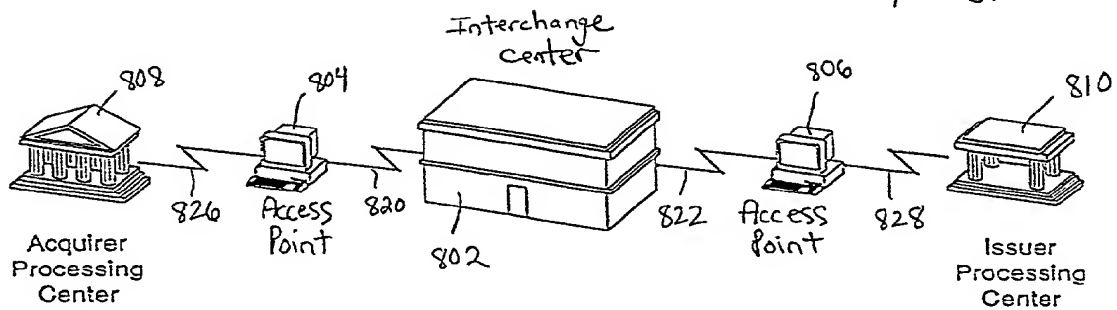


FIG. 17

Authorization Flow

FIG. 19



800 → Telecommunications Network

Interchange Center Systems

FIG. 20

840 ↓

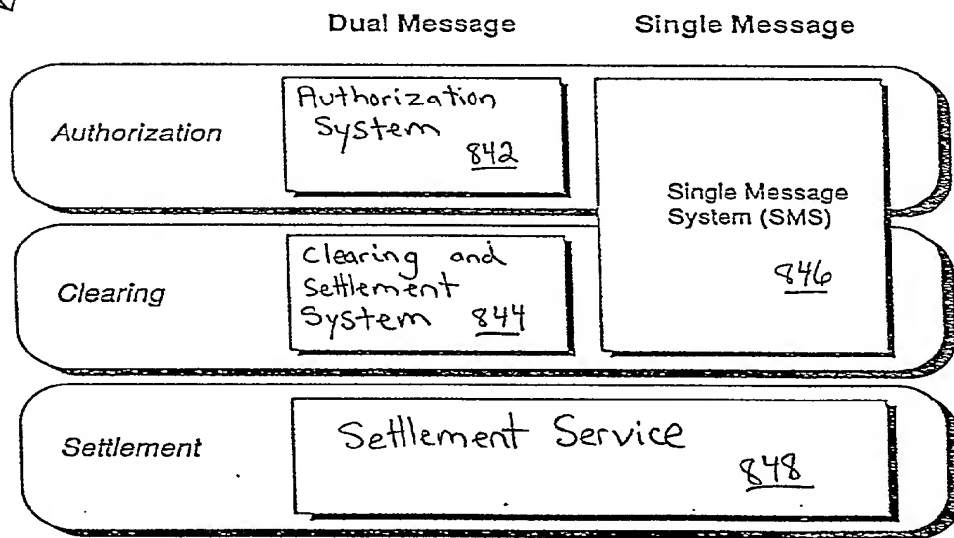
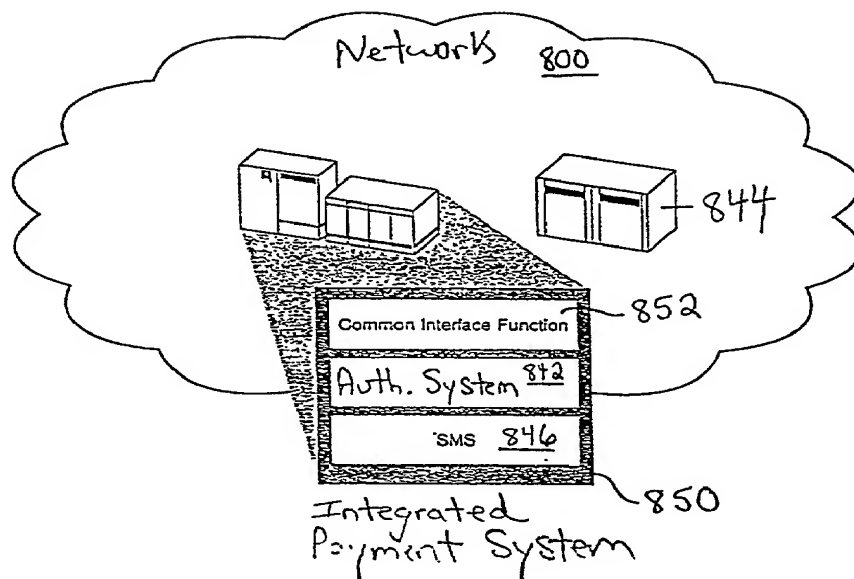


FIG.
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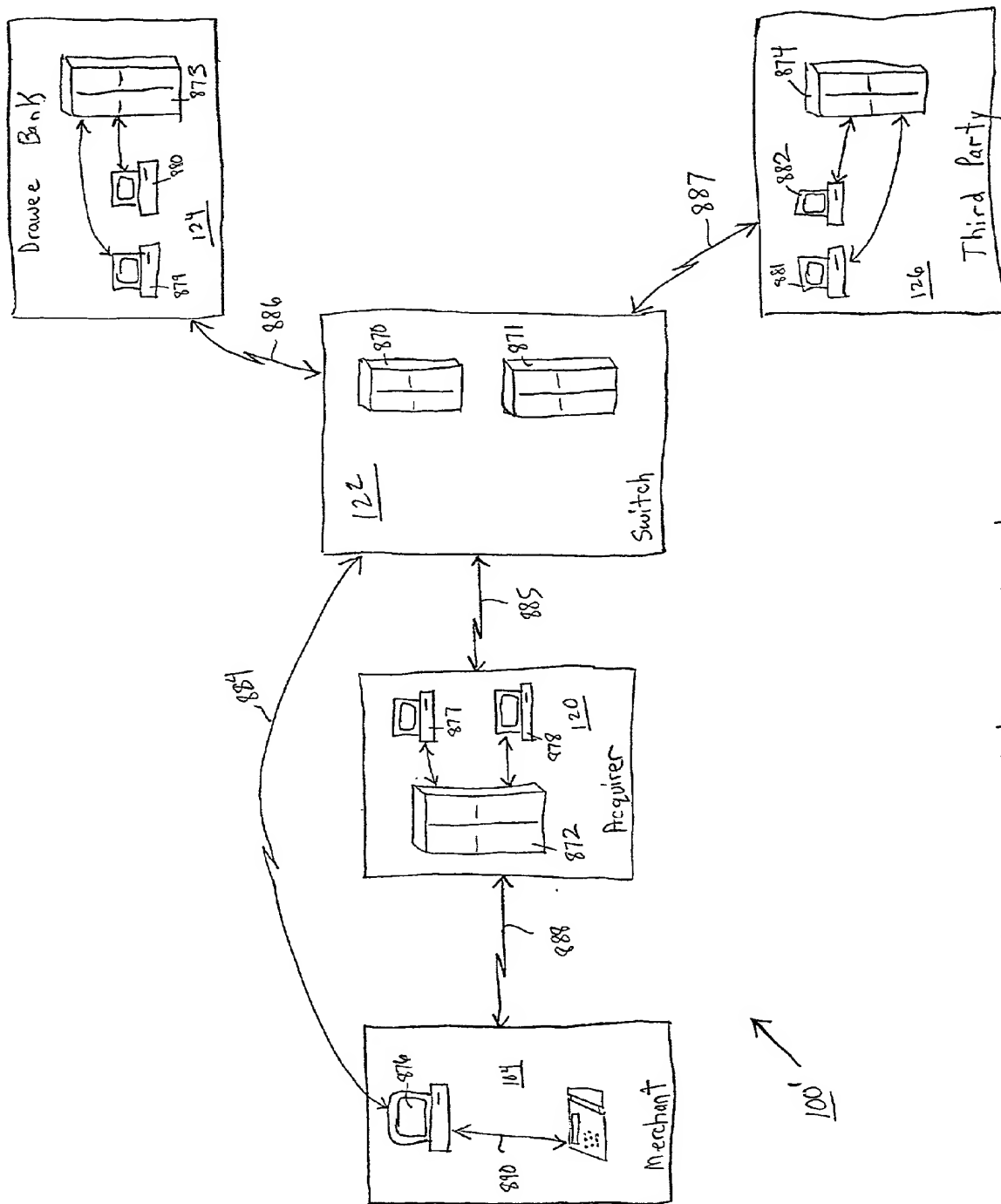
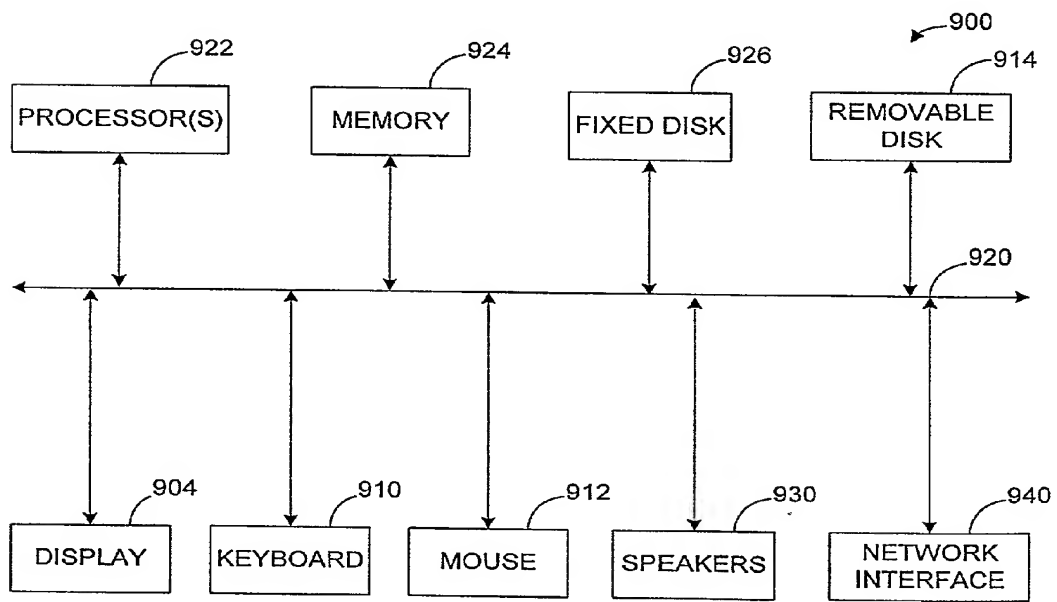
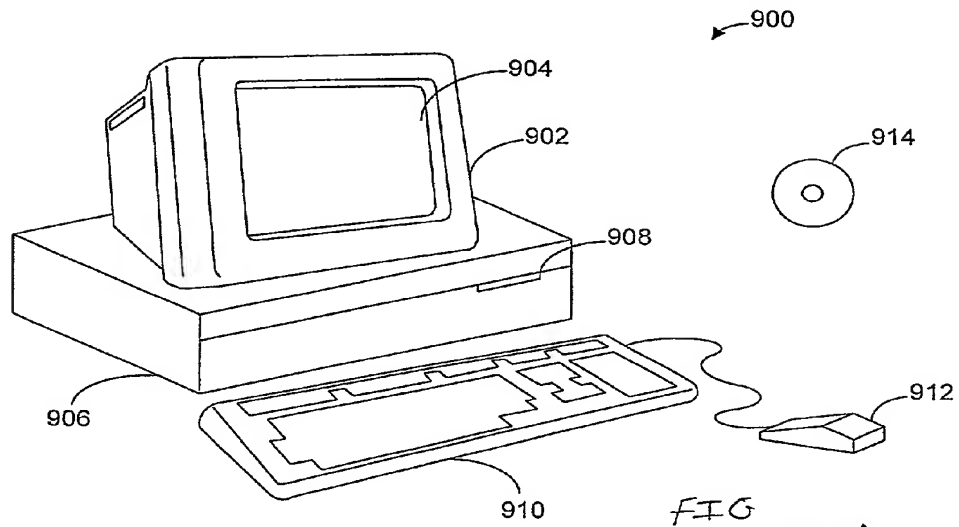


FIG. 22 Hardware Embodiment



POINT OF SALE CHECK SERVICE

[0001] This application claims priority of U.S. provisional patent application No. 60/225,566 filed Aug. 14, 2000, of provisional patent application No. 60/227,712 filed Aug. 24, 2000, and of provisional patent application No. _____ (Atty Docket No. VISAP062PX2) filed Feb. 22, 2001, which are all hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention relates generally to financial transactions. More specifically, the present invention relates to an online, real-time point-of-sale check authorization system.

BACKGROUND OF THE INVENTION

[0003] Paper checks count for over 50% of U.S. personal consumption expenditures. The handling and processing cost of paper checks at the point of sale, as well as the costs and losses associated with checks, presents significant loss to merchants and the depository institutions who accept these checks. In 1999 alone, consumers wrote an estimated 19 billion checks at the point of sale. Check handling costs and losses for merchants are estimated at \$23 billion per year and in 1999 this was an average of more than \$1.00 for every check written at the point of sale. Some estimates place bank costs for processing checks at close to 20% of non-interest expense.

[0004] For banks, these check processing costs are the single largest segment of non-interest related expense, totaling more than \$40 billion in cost for all checks and approximately \$11 billion dollars for point-of-sale checks alone. Merchants spend about \$10 billion in acceptance and deposits of paper checks. Merchants' losses from acceptance of checks, with fraud and other reasons, total more than \$12 billion dollars.

[0005] In today's merchant market, check authorizations are performed by a host of third-party, non-bank competitors who authorize checks using various combinations of negative-file and credit-bureau positive information often in conjunction with neural models, to advise merchant clients of the likelihood that a check will clear the settlement process once it is posted. The third-party information system uses check and consumer account data without paying banks for that data. These third-party check authorizers have also begun pilot offerings in which the paper check is truncated at the point of sale and converted into an ACH item for settlement.

[0006] Although there are notable advances in the prior art, the available references do not provide an adequate solution to the cost and difficulty of processing paper checks. Most relevant references are U.S. Pat. Nos. 5,832,463, 5,703,344 and 5,175,682.

[0007] U.S. Pat. No. 5,832,463 discloses a system for the real-time conversion of checks issued by a participating bank or through an Automated Clearing House (ACH) transfer. This system is inapplicable for participating drawee banks. For non-participating banks, a paper check must be processed. The system is closed and only handles checks from institutions that are part of the EDS system. This system is for Conversion Only; the system does not teach or suggest the real-time verification or guarantee of checks at the point of sale.

[0008] U.S. Pat. No. 5,703,344 discloses a real-time, point-of-sale check confirmation and guarantee system that uses VisaNet for checks issued by member or non-member third-party institutions. This system does not involve check conversion and only discloses batch processing of checks. Further, this system does not disclose real-time check conversions.

[0009] U.S. Pat. No. 5,175,682 discloses a system of processing checks by verifying and converting in either batch mode or in real-time if certain predefined circumstances are present. There is no online access to demand deposit accounts nor online, real-time access for any bank. The system does not disclose the real-time guarantee of any personal checks.

[0010] U.S. Pat. No. 5,053,607 discloses a point-of-sale device only and has no details concerning a payment infrastructure. U.S. Pat. No. 5,532,464 discloses an electronic check presentment system but still involves the processing of a paper check. U.S. Pat. No. 6,006,208 discloses a system for making a payment by telephone. U.S. Pat. No. 5,484,988 discloses check clearing through an ACH transaction which is batch driven and not in real-time. Further, conversions are not performed online, in real-time against any possible bank. U.S. Pat. No. 5,963,219 discloses a system for generating electronic checks. There are no paper checks involved at all and there is no conversion of paper checks occurring.

[0011] It is desirable then for a point-of-sale check service to be able to authorize checks online and in real-time for any possible bank upon which a check is drawn.

SUMMARY OF THE INVENTION

[0012] To achieve the foregoing, and in accordance with the purpose of the present invention, a POS (point of sale) Check Service is disclosed that converts paper checks online and in real-time into an electronic funds transaction. This service will significantly reduce paper check processing costs for member banks and merchants. Advantageously, the service accepts any paper personal check from any bank, and authorizes it online, in real-time at the point of sale. The paper check is returned to the consumer for his or her records. It is not necessary for the merchant to keep the paper check.

[0013] The service operates in real-time over a data communications network and does not need to rely upon voice communications. Also, unlike a typical ACH transaction which may take 48 hours, check authorization can occur in a matter of seconds. No PIN (personal identification number) is required to be entered, and the system can process a check from a participating bank or from a non-participating bank.

[0014] It is estimated that by routing and processing electronic check transactions, banks and merchants will eliminate billions of dollars in annual paper check handling costs. Thus, a benefit of the POS Check Service is significantly reducing paper check processing costs for banks and merchants. For acquiring banks, the POS Check Service leverages existing payment networks and infrastructure and adds a new source of revenues for all points of sale. For a merchant, the POS Check Service lowers the cost of check processing, reduces risk because paper check handling is eliminated, speeds customer checkout, provides more effi-

cient clearing and settlement, reduces losses by providing options for check guarantee or verification, and lowers check losses by retrieving online check authorizations directly from the bank on which the check is drawn. For a participating drawee bank, the POS Check Service provides an opportunity to authorize checks, allows use of existing infrastructure to convert paper checks to electronic transactions, and greatly reduces the cost of processing checks. For the customer who writes the check, the POS Check Service provides transaction details that can be included on a monthly bank statement, enables faster checkout, returns the voided check and sales draft receipt to the customer, and also improves security because the check is returned to the customer at the time of the transaction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

[0016] **FIG. 1** illustrates an embodiment of the POS Check Service authorization and clearing system.

[0017] **FIG. 2** is a flow diagram describing the overall POS Check Service flow.

[0018] **FIG. 3** is a flow diagram describing the setup procedures for the POS Check Service.

[0019] **FIG. 4** is a more detailed illustration of a paper check.

[0020] **FIG. 5** is a flow diagram describing how a request is initiated to convert a check at the point of sale.

[0021] **FIGS. 6A, 6B and 6C** are a flow diagram describing the authorization and clearing of a transaction.

[0022] **FIG. 7** is flow diagram describing the completion of a transaction at the point of sale.

[0023] **FIG. 8** illustrates an example of a transaction receipt printed at the point of sale.

[0024] **FIG. 9** is a flow diagram describing the settlement of transactions.

[0025] **FIG. 10** illustrates the settlement process for transactions settled via the service organization or switch.

[0026] **FIG. 11** illustrates the settlement process for POS Check Service transactions via the ACH.

[0027] **FIG. 12** illustrates a settlement flow for a participating drawee bank.

[0028] **FIG. 13** illustrates a settlement flow for a non-participating drawee bank.

[0029] **FIG. 14** illustrates an alternative settlement flow for a non-participating drawee bank.

[0030] **FIG. 15** illustrates an example of an authorization and settlement flow in which the acquirer and the drawee bank are the same.

[0031] **FIG. 16** is an example of an authorization flow in which the acquiring bank is not the same as the drawee bank.

[0032] **FIG. 17** is an example of an authorization flow in which the customer's check is to be drawn on a bank which does not participate in the POS Check Service.

[0033] **FIG. 18** is an example of an activity report for a participating drawee bank.

[0034] **FIG. 19** illustrates a telecommunications network suitable for implementing an embodiment of the present invention.

[0035] **FIG. 20** illustrates systems housed within an interchange center to provide online and offline transaction processing.

[0036] **FIG. 21** illustrates another view of the components of the telecommunications network.

[0037] **FIG. 22** illustrates in more detail a suitable hardware embodiment for the POS Check Service.

[0038] **FIGS. 23A and 23B** illustrate a computer system suitable for implementing embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0039] A merchant first initiates a POS Check Service transaction by entering the amount of the sale and by passing the check through a reader to electronically capture checking account data from the magnetic ink character recognition (MICR) line encoded on the customer's check. The merchant can optionally key enter customer identification information, such as a driver's license number, at the point of sale. The check data, identification data and sale amount are combined with other data elements and forwarded to a service organization for processing. As another option, the merchant decides whether to send all transactions through the Service or only participating transactions through the Service. For a merchant opting to send only participating transactions through the Service, the service organization may distribute routing tables which the merchant can use to identify participating transactions. These transactions would be cleared and settled through the service organization. In this instance, these transactions would never be routed through the ACH.

[0040] The service begins by swiping the check through a check reader at the point of sale. The transaction is formatted into a check authorization message and one of three service options is selected automatically or manually: Conversion Only; Verification with Conversion; or Guarantee with Conversion. Under Conversion Only the transaction is approved or declined without the requirement of account verification processing, and the merchant retains the risk of loss. Under Verification with Conversion, the check authorization message is routed to the participating drawee bank or to a third-party authorizing agent for verification of the probability that the check will be paid. The authorizing agent can accept or decline based on access to the demand deposit account (DDA) and/or the third-party risk management database. Again, the merchant retains the risk of loss.

[0041] Under Guarantee with Conversion, the check authorization request message is routed to the participating drawee bank or to a third-party authorizing agent to guarantee the check. A check guarantor effectively buys the check from the merchant at a discount, eliminating the risk

of loss to the merchant. The guarantor makes an accept or decline decision, based on access to the DDA account and/or to a third-party risk management database. The guarantor bears the risk of loss.

High Level System Description

[0042] FIG. 1 illustrates POS Check Service authorization and clearing system 100. System 100 is used to convert a paper check at the point of sale into an electronic transaction and to authorize and clear the check. Customer 102 wishes to perform a transaction with a merchant 104 using a paper check 106. Merchant 104 is any entity that accepts consumer checks in payment for merchandise or services. Check 106 is any suitable paper personal check presented to a merchant in payment for a purchase. Check 106 may be completely filled out by the customer or it may be completely blank, having only identifying characters along its lower edge for reading by a device. Although check 106 may be any suitable paper check, under current NACHA (National Automated Clearing House Association) rules, certain checks may not legally be used, although technically their use is feasible. For example, under NACHA rules, checks such as corporate checks, government checks, traveler's checks, checks not linked to an ABA demand deposit account, checks drawn on invalid ABA numbers, etc., are not currently accepted within the system. Notwithstanding the above, it is contemplated that as rules are changed, the system may accept additional types of checks.

[0043] Present at the point the sale are any number of devices that assist the merchant with reading information from the check and with acquiring information from the customer. Preferably, a MICR (magnetic ink character recognition) device 110 is used to read identifying information from check 106. Alternatively, other devices may be used to either read information from the check or to receive identifying information needed to identify the checking account from which the customer wishes money to be withdrawn. For example, an OCR device 112 may be used to read information from check 106. In other embodiments, check 106 is not present and the customer presents other suitable unique information to identify the checking account from which he or she wishes money to be withdrawn. For example, biometrics reader 114 may be used to uniquely identify the customer and a particular checking account, and checking account information would be contained at a central database. A convenience card is another way to link an account number to a consumer.

[0044] Further keypad 108 may be used by the merchant or customer to enter not only identifying information for the checking account, but also information concerning the transaction amount and any other customer identifying information. Keypad 108 may be combined with any of devices 110-114, may be incorporated into a cash register, may be part of a computer, or may be a standalone device. In a preferred embodiment, the merchant swipes check 106 through MICR device 110 which is incorporated into a cash register.

[0045] Acquiring bank 120 is a financial institution that contracts with the merchant and directly or indirectly submits check transactions for authorization, clearing and settlement. A processor may also perform these functions on behalf of the acquirer—both are hereinafter referred to as the

acquirer or the acquiring bank. Service organization 122 (also termed the “switch” is a financial service organization that accepts messages from acquirer 120 and routes them to either drawee bank 124 or to third party 126. Service organization 122 may be any suitable organization for performing clearing and settlement such as MasterCard, American Express, Discover, etc. In a preferred embodiment, service organization 122 is Visa U.S.A. Inc. of San Francisco, Calif.

[0046] Drawee bank 124 is a customer bank that is participating in the POS Check Service and is connected online via a network to service organization 122. The drawee bank is where the customer maintains his or her checking account, and the bank issues checks to the customer. Alternatively, a processor may act on behalf of the drawee bank—both are referred to hereinafter as the drawee bank. Third-party authorizing agent 126 is an entity that authorizes POS Check Service transactions for non-participating banks and creates the corresponding ACH transaction.

[0047] FIG. 2 is a flow diagram describing the overall POS Check Service flow. Initially, various setup procedures are preformed by or for the merchant, the acquirer, the drawee bank, the third party and the service organization. These steps typically occur before the service is operational and before a customer performs a transaction. A customer presents a paper check as part of step 154 in which a request is initiated for clearing and settlement; this step is explained in greater detail below.

[0048] In step 158 system 100 performs authorization and clearing of the transaction in order to indicate to the merchant whether the transaction is authorized or not; this step is explained in greater detail below. In step 162 the transaction is completed at the point of sale depending upon the results returned. Finally, the transaction is settled in step 166 between the acquirer and either the participating drawee bank or a non-participating bank.

Detailed Flow Description

[0049] FIG. 3 is a flow diagram describing the setup procedures for the POS Check Service. The setup procedures typically occur before the POS Check Service is available to conduct a transaction. Regarding the point of sale, there are various tasks a merchant performs in order to be ready to convert a check at the point of sale. For example, a merchant installs devices at the point of sale that can read MICR, OCR or other data on checks, installs terminals that allow key entry of any additional data, and installs devices for printing a sales draft receipt and to initiate reversals. A merchant also develops or installs a point-of-sale application for use with a check reader that can read and assemble the required information for transmission. Development of these application programs is known to those of skill in the art. A merchant also designates a bank account where electronic check funds can be deposited. Depending upon the telecommunications service used, the merchant works with its acquirer to order and install the required telecommunications configuration, and also works with its acquirer to agree

on the settlement process and reconfiguration procedures. The merchant also works with a third party agent to set up parameters for velocity checks (which may also be handled by an acquirer), sets up service options, and performs customer education and clerk training.

[0050] The acquirer also performs certain tasks to enable POS Check Service transactions. For example, the acquirer provides hardware and software for communication with a merchant and a service organization which includes the ability to receive, reformat and send POS Check Service transactions. The acquirer also provides a unique merchant identifier for each merchant name and location that originates transactions. The acquirer also selects service options to be supported, etc.

[0051] A participating drawee bank is enabled to receive and respond to POS Check Service transactions. Also, the drawee bank is enabled to receive non-parsed MICR data and return parsed MICR data elements in transit routing number and check number fields. The drawee bank also develops a means for reporting POS Check Service transactions on the customer's checking account statements.

[0052] In addition to the above setup performed by a participating drawee bank, the third party also performs tasks such as arranging customer support for transactions they deny, arranging settlement with the switch for POS Check Service transactions they authorize and reconciliation of those transactions, setting up service options supported, providing reports or raw data for reporting, creating an ACH file on behalf of the acquiring banks, and providing additional services to acquiring banks, such as image archiving and collection services.

[0053] FIG. 4 is a more detailed illustration of paper check 106. As described above, check 106 may be any suitable personal check or even other types of checks as permitted by law. On the lower edge of check 106 is a line of information 252 commonly termed the MICR (magnetic ink character recognition) data. Included within this line are separation characters 254, 258, 262 and 266 which separate the various pieces of information. Information 256 is a sequence of characters that is the transit routing number, also termed the ABA number. Information 260 is a sequence of characters identifying the customer's account number, termed the on-us data. Information 264 is a sequence of characters identifying the serial number of the check. As separators 254, 258, 262 and 266 are symbolic characters (also termed "nonprintable characters"), they are typically translated later into alphanumeric characters. When the separators in the MICR data are later translated into alphanumeric characters, they are typically translated to the characters "T", "O", "A" and "D" which is referred to as the raw TOAD format. Translation occurs because a computer systems cannot understand nonprintable characters, and this simple substitution allows the system (or another system) to eventually parse the information.

[0054] FIG. 5 is a flow diagram describing how a request is initiated to convert a check at the point of sale. At this point in time, a customer is performing a transaction with a merchant and desires to make a purchase using a paper check for payment. In step 202 the clerk enters the amount

of the transaction into one of the devices described in FIG. 1. Of course, this amount may also be entered by the customer or may in some instances be automatically entered into a cash register using scanning or other known techniques. In step 206 the customer presents a paper check for payment. The check is in payment for goods or services and may not be filled out. The customer may receive cash back if the POS Check Service transaction is keyed for an amount above the purchase price. The cash back amount is uniquely identified in the POS Check Service authorization message.

[0055] In step 310 the check is swiped through one of the devices described in FIG. 1. Preferably, the check contains MICR data and is swiped through a MICR device. Next, the device reads the raw MICR data from the bottom of the check in step 314. This data will include the transit routing number, the account number of the customer and the check serial number. The device translates the symbols into the appropriate alphanumeric characters (raw TOAD format). This translation may also occur at the acquirer. This translation occurring at the device or at the acquirer is not an actual parsing, it is simple substitution of familiar alphanumeric characters for nonprintable separation symbols. The translation assumes no knowledge about the structure of the MICR encoded information other than recognizing which nonprintable symbol matches with which alphanumeric character. As mentioned earlier other devices and readers may be used to obtain the necessary information for the paper check and in certain embodiments the paper check is not required but the identifying information is entered via a keypad or other means herein described.

[0056] In an optional step, in step 322 additional customer information is entered into the device. This additional customer information may include identification such as driver's license number, state identification number, military identification number, etc. Various types of customer information are presented in Table 1. This information is optional and variable and depends upon the individual requirements of the participating merchant, acquirers and third-party authorizing agents.

[0057] As shown in Table 1, the processing code is used to identify the type of POS Check Service transaction that the merchant desires. A merchant may request that a check be converted, be verified and converted, or be guaranteed and converted. If a merchant requests Conversion Only, the transaction will be approved or declined by a participating bank on which the check is drawn or by a third-party authorizing agent with minimal account verification processing. If the merchant chooses Verification with Conversion, the request method will be routed to a participating bank on which the check is drawn or to an authorizing agent for verification of the probability that the check will be paid based on information available at the time of the request. The merchant will then receive either an approval or decline response. If the merchant chooses the Guarantee with Conversion option, the request message will be routed to a participating bank on which the check is drawn or to an authorizing agent to guarantee the check. The merchant will then receive either an approval or decline response.

TABLE 1

<u>Additional Customer Data—Private</u>	
Field Name	Usage
ID Type and Number	Identifies the type and number of the customer identification present at the point of sale. Used in the request. This field may be repeated as often as necessary, if information from multiple ID types is captured at the point of sale. The first two positions in this field are either a valid state code or an ID Type such as Military ID, Courtesy Card, social security number, proprietary card, military base, embassy or traveling merchant. If the value in the first two positions is a valid state code, then the number following it is either a valid driver's license number or State ID. If the value in the first two positions is a valid ID Type, then the number following it corresponds to the ID Type presented.
Date of Birth	Identifies a date of birth, field length, and contents. Used in the request.
Telephone Number	Identifies a telephone number, field length, and contents. Used in the request.
Response Source	A one-digit response source identifier returned by a non-bank authorizer in all responses. Used in the response.
Reference Number	Identifies a reference number of any type, field length, and contents. Used in the response.
Proprietary Response Information	Identifies proprietary response information defined by an authorizing agent, field length, and contents. Used in the response.
Receipt Information	Identifies customer receipt information, field length, and contents. Used in the response.
Call Back Information	Contains non-bank authorizer name, address, and customer service telephone number. The field is preferably returned by non-bank authorizers on declines of original requests. Used in the response.

[0058] In step 326 the request message is built using the assembled information. The message can be assembled at the merchant or at the acquirer, but is typically assembled before being transferred to the service organization. The merchant also determines which service it desires, i.e., Conversion Only, Verification with Conversion or Guarantee with Conversion. Regarding the different methods of service, a merchant may choose Conversion Only because his main objective is to eliminate paper processing and he anticipates a low-risk with the item. If a merchant is concerned about the authenticity of a check and wants to verify that funds are present in the customer's checking account at the time of purchase, the merchant may choose Verification with Conversion because there is a greater likelihood that the merchant will be paid. If a merchant wants guaranteed payment of the item, he may choose Guarantee with Conversion, in which case the guarantor bears the liability even if the check is not honored.

[0059] The POS Check Service message may be assembled using any desired format until it reaches the host connected to the service organization, at which point it must be formatted into the standard message format of the service organization, and includes such information as a merchant terminal identifier, a merchant identifier, a third-party identifier, the amount of cash back desired, the RAW TOAD MICR data, the transaction amount, terminal capability information, information sufficient for clearing and settlement, and an indication of the service desired by the merchant. A list of possible information is presented in Tables 2 and 3. Other data fields include: Bitmap, secondary; transmission date/time; Systems trace audit number; local transaction time; local transaction date; settlement date; merchant type; acquiring institution country code; acquiring institution ID code; retrieval reference number; card acceptor terminal ID; card acceptor ID code; card acceptor name/location; transaction currency code; national POS geographic data; network ID code; acquirer business ID; receiving institution ID code and additional trace data.

TABLE 2

<u>Request Message</u>		
Field Name	Use	Suggested Data Requirements
Processing Code	Identifies the type of POS Check Service transaction.	Guarantee with Conversion = 03. Verification with Conversion = 04. Conversion Only = 18.
Transaction Amount	Amount of transaction.	
Point of Service Entry Mode Code	Identifies the method used to capture the MICR data.	

TABLE 2-continued

<u>Request Message</u>		
Field Name	Use	Suggested Data Requirements
POS Condition Code	Serves as an identifier, in conjunction with the Processing Code.	The POS Condition Code for POS Check Service transactions is 52 on all original full financial transactions.
Check Settlement Code	Provided by the service organization in responses to indicate the settlement disposition of the transaction.	Switch Settlement Code = 1. ACH Settlement Code = 2. Field not be present if the item will not be settled.
Additional Customer Data-Private	May be used for any customer identification information specifically required by an authorizer.	See Table 1.
Additional POS Data	A private-use field defined by the service organization to provide additional information about the point of sale or service.	
Other Amount, Transaction	Should contain the cash back amount from the transaction, if any.	The cash back amount should not exceed the Transaction Amount.
Transaction Identifier	Will contain a unique transaction identifier assigned by the service organization.	This field will be sent to transaction recipients and returned to transaction originators.
Receiving Institution ID Code	Contain the BIN ID of the third-party authorizer that the originator wants to receive the transaction.	If the check is drawn on a participating drawee bank, the service organization will route the transaction to that bank. Otherwise, the transaction will be sent to the designed third-party authorizer.
Supporting Information	Contains the MICR information from the customer's check.	See Table 3.

[0060]

TABLE 3

<u>MICR Information</u>		
Field Name	Data Content	Format
Data Type Identifier	RM	Identifies the data contents as unformatted MICR information.
Data Length Identifier	999	Indicates the length of the MICR data contained in the field.
MICR Information	Contains the unaltered contents of the MICR line, with spaces preserved, read from the customer's check by a terminal. At a minimum, the Transit Routing Number and Customer Account Number (On-us field) should be present. Refer to Understanding and Design Checks, ANSI Standard X9/TG-2 (1990).	The unformatted MICR data is preferably the same MICR line from the check, including spaces, except that the MICR symbols should be replaced as follows: The Transit symbol is replaced by the letter "T" in either upper or lower case. The On-us symbol is replaced by the letter "O" in either upper or lower case. The Dash symbol is replaced by the letter "D" in either upper or lower case.

[0061] FIGS. 6A, 6B and 6C are a flow diagram describing the authorization and clearing of a transaction. Once a complete POS Check Service request message has been received by the host, and has been reformatted, the host sends the request message online to the service organization

(switch) for central processing and routing to an authorizing endpoint. In step 402 the host reformats the message and sends it to the service organization. This reformatting is done in order to be in compliance with the switch interface specifications.

[0062] In step 406 the switch performs exclusion checking on the request. As part of the switch processing, a limited ABA exclusion verification is applied. In one embodiment, an ABA exclusion table is used. If the authorization request contains an ABA number (the transit routing number) that is included in the ABA exclusion table, the switch will immediately return a decline response to the host with an appropriate response code. Included in the exclusion table are ABA numbers that identify government checks (J.S. Treasury and Federal Reserve), traveler's checks, or an instrument with a non-check ABA number. ABA numbers are known to one of skill in the art and the table may be edited to exclude any types of checks based upon an ABA number. Preferably, the switch or its agent should be able to add or delete ABA numbers from the repository of online exclusion and offline translation data. These data repositories should be updated not less than daily.

[0063] Preferably, the ABA number is extracted from the raw TOAD format MICR data without the need for parsing the data. Because it is known that ABA number is bounded by the "T" tag and is nine digits long, it is simple to extract the number for exclusion checking and later routing. Essentially, the switch "looks" at the ABA number but does not perform parsing (although it is possible for parsing to occur here).

[0064] Preferably, the service organization also edits the transaction request to ensure valid data formats, and to insure the transaction complies with the business rules governing the service. Other checks such as duplicate checking are performed. The switch performs duplicate checking on originals to ensure merchants and acquirers do not submit identical requests. If the transaction passes these edits and checks, the service organization forwards the transaction to either a participating bank on which the check is drawn or to a third-party authorizing agent.

[0065] Based upon a list of participating banks, in step 410 the switch attempts to match the transit routing number with that of a participating drawee bank. If there is a match, then in step 414 the switch determines whether the service requested of the merchant matches a service provided by the drawee bank. If so, then in step 418 the settlement code in the request message is set to a "1" (or other symbol) to

signify that settlement will eventually occur through the switch. The switch also generates a unique transaction identifier for the current transaction in step 430. Preferably, all transactions have an audit trail which ties together related transactions in a transaction set—thus, future reversals, voids, etc. can all be related to the original transaction. The unique transaction identifier may be used for this purpose. Next, this request message is sent to the participating drawee bank in step 434. If the switch determines the drawee is unavailable, a response for "Service Not Available" is sent to the merchant's acquirer.

[0066] In step 438, the bank handles the request as per the service requested by the merchant. The raw TOAD MICR data is first parsed as explained below. If Conversion Only is requested, then the bank may merely check to see that a valid account does exist at the bank, that the account has not been closed, and that the account is not fraudulent. (If invalid, a "Do not Honor" response is returned to the merchant's acquirer.) The bank is not obligated to perform further checking or verification. When Verification with Conversion is requested, then in step 454 the bank not only verifies that the account is valid, but also that the amount of funds in the account is adequate for the transaction. In a preferred embodiment, a bank will also place a hold upon the account for the transaction amount in this step. If Guarantee with Conversion is desired, then in step 462 the bank will place a hold on the account for the amount of the transaction and will guarantee that the amount will be paid. In other words, the bank must pay the amount regardless of the account balance.

[0067] Next, the bank generates a response message and returns it to the service organization. This response message contains a variety of information concerning the transaction; an example response message is shown in Table 4. Included within the response message is a response code generally indicating whether the request is approved. Examples of response codes are shown in Table 5. Table 5 shows the business reason for the response, response code, whether the response is approved or declined, and the responding endpoint eligible to use each of the codes. Once switch 122 receives the response message, it determines if there is an approval in step 470.

TABLE 4

Field Name	Response Message Fields	
	Data	Format
Response Code	Contains a Response Code valid for POS Check Service transactions as shown in Table 5.	
Additional Data, Private	No data is required in this field.	Any data that a check request respondent chooses to include in the message should be formatted as shown in Table 1.
Support Information Field Identifier	This field contains: \$V	The POS Check Service field identifier appears in the first two types of the field, as shown.

TABLE 4-continued

Response Message Fields		
Field Name	Data	Format
Transit Routing Number	The drawee bank's Transit Routing Number (ABA Number).	The POS Check Service field identifier appears in the first two bytes of the field, as shown. The Transit Routing Number has a fixed length of 9 numeric characters and may be formatted as follows: AB999dddd, where AB identifies the sub-field, 999 the length of the data, and dddd, the actual data contents.
Customer Account Number	The customer deposit account number	The customer deposit account number should be present, a maximum of 19 characters and preferably formatted as follows: AN999dddd, where AN identifies the sub-field, 999 the length of the data, and dddd, the actual data contents.
Check Serial Number	The check serial number of the check being converted.	The check serial number should be present, a maximum of 15 characters, and preferably formatted as follows: CK999dddd, where CK identifies the sub-field, 999 the length of the data, and dddd, the actual data content. Any of the alpha characters sent in this field in the request message ("t", "o", "d") should be stripped out when the field is returned.

[0068]

TABLE 5

Response Codes					
Business Condition	Response Code	Approve/Decline	Service Organization	Non-bank Authorizer	Participating Drawee Bank
Unconditional Approval	00	A		Y	Y
Invalid merchant ID	03	D		Y	
Do not honor	05	D		Y	Y
Invalid account	14	D		Y	Y
No such issuer	15	D	Y		
NSF	51	D		Y	Y
Transaction not permitted	57	D	Y	Y	Y
Too much cash (over merchant or bank limit)	61	D		Y	Y
Exceeds withdrawal frequency limit	65	D		Y	Y
Unsolicited reversal	76	D	Y		
Reversal received	80	D	Y		
form denied request					
Issuer unavailable	91	D	Y		
Routing error	92	D	Y	Y	Y
Duplicate Transaction	94	D	Y		
System error	96	D		Y	Y
Approval, keep first check	T0	A		Y	
Check is OK, but check cannot be converted	T1	D		Y	
Invalid Transit Routing Number	T2	D	Y	Y	
Amount greater than established service limit	T3	D		Y	
Unpaid items, failed negative file check	T4	D		Y	
Duplicate check number	T5	D		Y	Y

TABLE 5-continued

Business Condition	Response Codes				
	Response Code	Approve/ Decline	Service Organization	Non-bank Authorizer	Participating Drawee Bank
MICR error	T6	D		Y	Y
Too many checks (over merchant or bank limit)	T7	D		Y	Y

[0069] Returning for a moment to the “NO” branches of steps 410 and 414, if the transit routing does not match the table of participating banks, or the service requested by the merchant does not match the service provided by the participating bank, then in step 484 the settlement code in the request message is set to a “2” (or other suitable symbol) to signify that settlement will be through ACH because a third-party authorizing agent is used. The following steps describe actions occurring when the authorization request is sent to the third-party authorizing agent 126 in step 485. In some ways, the request is handled in a similar fashion as the participating drawee bank handles the request as described in FIG. 6B. Because the third party, however, does not have control over the customer’s account, it must use other means to provide verification and guarantee. In step 486 the request is handled as per the service request. The raw TOAD MICR data is first parsed as explained below. If the request is for Conversion Only, then in step 488 the third party, at a minimum, verifies that the check is eligible to be converted into an ACH item.

[0070] If the request is for Verification with Conversion, then in step 490 the third party, at a minimum, performs velocity checks, searches their database of returned checks, verifies against risk models, etc., to determine the probabil-

ity that the POS Check Service transaction amount will be paid by the customer’s bank. If the request is for Guarantee with Conversion, then in step 492 the third party performs velocity and database checks and will underwrite the amount of the request, guaranteeing payment even if the item is returned. Finally, in step 493 the third party generates a response message in much the same way as in step 466 and sends the response to the service organization.

[0071] Returning to step 470 of FIG. 6B, once the response message has been received by the service organization, it determines whether the transaction has been approved. More specifically, switch 122 processes response messages as shown in Table 6. If the transaction has been approved, the message is sent to the acquirer or merchant host who then reformats the message into the protocol used with the merchant, and sends the response message back to the merchant. If the transaction was not approved, the switch first removes the settlement code in step 478, indicating that the item is not settled, before sending the response message back to the acquirer or merchant. Once the response message is received by the merchant, the transaction is then completed at the point of sale as described below.

TABLE 6

Switch Processing of Response Messages		
Field Name	Contents	Switch Processing
Response Code	The Response Code should be valid for POS Check Service transactions and valid for the sending party, as shown in Table 5.	If the Response Code is not valid, the switch will reject the transaction and will send a “decline” response to the originator of the response, with Response Code 91.
Check Settlement Code	Switch will add under certain conditions.	If the response message carries an approval Response Code and passes all Switch edits, the Switch will add this field, indicating the settlement type for the transaction. A value of 1 means that the Switch will settle the transaction. A value of 2 means that the transaction will settle through the Automated Clearing House (ACH).
Transaction Identifier	Contains the Transaction Identifier.	The Switch will restore the Transaction Identifier, if it is not returned in the response message.
Supporting Information	Contains the Transit Routing Number, the Customer Account Number, and the Check Serial Number.	The Switch will edit the field for presence, correct formatting and required data. If the field is not present, the Switch will reject the transaction. If the transaction is approved and if the required Transit Routing Number, Customer Account Number, and Check Serial number are not present, or the formatting of the field is incorrect, the Switch will reject the transaction. If the transaction is approved and if the Transit Routing